

Taxon: <i>Astronium lecointei</i> Ducke	Family: Anacardiaceae
Common Name(s): almendro macho bolaquiro guasano miracoatiara misionero muiracatiara	Synonym(s): <i>Astronium lecointei</i> f. <i>tomentosum</i> <i>Astronium lecointei</i> var. <i>tomentosum</i>

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 18 Apr 2022
WRA Score: 0.0	Designation: L	Rating: Low Risk

Keywords: Tropical Tree, Timber Source, Shade Tolerant, Polygamodioecious, Wind-Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	n
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	n
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	n
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	n
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens		

Qsn #	Question	Answer Option	Answer
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems		
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally		
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation		
607	Minimum generative time (years)		
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	y
705	Propagules water dispersed	y=1, n=-1	n
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m ²)		
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	n
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	Barkley, F. A. (1968). Anacardiaceae: Rhoideae: Astronium. Phytologia 16(2): 107-152	"Distribution: Venezuela and the upper Amazon drainage of Brazil." [No evidence of domestication]

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	NA

201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	High
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 14 Apr 2022]	"Native Southern America NORTHERN SOUTH AMERICA: Suriname, Venezuela [Bolívar (n.w.), Sucre] BRAZIL: Brazil [Amazonas, Pará] WESTERN SOUTH AMERICA: Peru [Madre de Dios]"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 14 Apr 2022]	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Tropicos.org. (2022). Tropicos v3.3.2. Missouri Botanical Garden. http://www.tropicos.org/ . [Accessed 14 Apr 2022]	Distributed from 150 m - 1451 m elevation at tropical latitudes from 07°40'N - 00°10'N, and 03°52'S - 17°00'S

204	Native or naturalized in regions with tropical or subtropical climates	y
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Qsn #	Question	Answer
	Source(s)	Notes
	Lanjouw, J. & Stoffers, A. L. (1976). Flora of Suriname. Vol. II, Part 2. Papilionaceae, Mimosaceae, Connaraceae, Annonaceae, Additions and Corrections. Foundation Van Eedenfonds, Leiden, The Netherlands	"Distribution: Venezuela, Brazil (Para, Amazonas)."
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 14 Apr 2022]	"Native Southern America NORTHERN SOUTH AMERICA: Suriname, Venezuela [Bolívar (n.w.), Sucre] BRAZIL: Brazil [Amazonas, Pará] WESTERN SOUTH AMERICA: Peru [Madre de Dios]"

205	Does the species have a history of repeated introductions outside its natural range?	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	No evidence
	Imada, C.T., Staples, G.W. & Herbst, D.R. 2005. Annotated Checklist of Cultivated Plants of Hawai'i. http://www2.bishopmuseum.org/HBS/botany/cultivatedplants/ . [Accessed]	No evidence. <i>Astronium balansae</i> recorded at Harold L. Lyon Arboretum
	Skolmen, R.G. 1980. Plantings on the forest reserves of Hawaii: 1910–1960. Institute of Pacific Islands Forestry, Pacific Southwest Forest & Range Experiment Station, US Forest Service, Honolulu, HI	No planting records for this species

301	Naturalized beyond native range	n
	Source(s)	Notes
	Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI	No evidence
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	WRA Specialist. (2022). Personal Communication	No evidence found as of 4/14/2022

302	Garden/amenity/disturbance weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	No evidence
	Global Invasive Species Database (2022). http://www.iucngisd.org/gisd/ . [Accessed 14 Apr 2022]	No evidence

Qsn #	Question	Answer
303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	No evidence
	Global Invasive Species Database (2022). http://www.iucngisd.org/gisd/ . [Accessed 14 Apr 2022]	No evidence

304	Environmental weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	No evidence
	Global Invasive Species Database (2022). http://www.iucngisd.org/gisd/ . [Accessed 14 Apr 2022]	No evidence

305	Congeneric weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	No evidence
	Global Invasive Species Database (2022). http://www.iucngisd.org/gisd/ . [Accessed 14 Apr 2022]	No evidence

401	Produces spines, thorns or burrs	n
	Source(s)	Notes

Qsn #	Question	Answer
	Barkley, F. A. (1968). Anacardiaceae: Rhoideae: <i>Astronium</i> . <i>Phytologia</i> 16(2): 107-152	[No evidence] "Large tree; branches maroonish gray, thickish, glabrous; the leaves 15-35 cm. long, pari- or imparipinnately compound, with about 8 or 9 leaflets; leaflets shining above, completely glabrous, 7 to 15 cm, long, 2-4.5 cm, broad, abruptly long acuminate at apex, more or less unequal and obtuse at base, petiolulate on petiolules 8-12 mm. long; internodes 3.5 to 5 cm. long; petiole 6 to 8 cm, long; inflorescences panicles 8 to 30 cm, long, glabrous, produced in cataphyll covered buds in the axils of the uppermost leaves; staminate flowers pedicellate on glabrous pedicels about 1 mm. long, sepals orbicular, obtuse, .5 mm. broad, .5 mm, long, petals oblong, obtuse, 1,2 mm, broad, 2 mm. long, stamens with filaments slender, anthers oblong-ovate, 1.2 mm, long, .5 mm. broad, the disk thin; the pistil rudimentary; pistillate flowers similar except sepals oblong-orbicular, 1.2 mm. broad, 1.5 mm. long, the petals slightly smaller and narrowed above, the stamens are rudimentary, and the pistil is about 2 mm. long, with three hemispherical stigmas, and three styles; fruit with calyx lobes about 1,4 cm. long, 3,5 to 4 mm, broad, rounded obtuse to subacute at apex, petals persistent, 2 mm. long, the ovary cylindric, narrowed at apex and base, about 4 mm. in diameter and as long as the sepals."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown. No evidence found

403	Parasitic	n
	Source(s)	Notes
	Lanjouw, J. & Stoffers, A. L. (1976). Flora of Suriname. Vol. II, Part 2. Papilionaceae, Mimosaceae, Connaraceae, Annonaceae, Additions and Corrections. Foundation Van Eedenfonds, Leiden, The Netherlands	"Large tree" [Anacardiaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	Grandtner, M.M. & Chevrette, J. (2012). Dictionary of Trees, Volume 2: South America: Nomenclature, Taxonomy and Ecology. Academic Press, New York	Unknown. Uses include agricultural implements, beams, billiard cues, cabinetwork, carpentry, chips, doors and windows framing, luxury furniture, paneling, planks, tool handles, veneer. Palatability of foliage or use as fodder not listed.

Qsn #	Question	Answer
405	Toxic to animals	n
	Source(s)	Notes
	Tropical Plants Database, Ken Fern. (2022). <i>Astronium lecointei</i> . http://tropical.theferns.info . [Accessed 18 Apr 2022]	"Known Hazards None known"
	Quattrocchi, U. (2012). <i>CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Tropical Plants Database, Ken Fern. (2022). <i>Astronium lecointei</i> . http://tropical.theferns.info . [Accessed 18 Apr 2022]	"Known Hazards None known"
	Quattrocchi, U. (2012). <i>CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	
	Source(s)	Notes
	Rodrigues, B. L., Bruzinga, J. S. C., Ribeiro, R. B. D. S., Gama, J. R. V., Machado, E. L. M., & Oliveira, M. L. R. D. (2021). Pattern and spatial associations of commercial trees in the Amazon. <i>Ciência Rural</i> , 51(6): 1-12	"The FNT is situated in the Dense Rainforest region, with the characteristic large-sized trees, ranging in height from 25 to 50 m (IBGE, 1990). Based on the Köppen classification, the Am type of climate prevails in this region, with annual accumulated precipitation of 1,983 mm/year and annual average temperature of 25.5 °C." [Habitat where <i>Astronium lecointei</i> not in a fire prone habitat]

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes

Qsn #	Question	Answer
	Schulze, M.D. (2003). Ecology and Behavior of Nine Timber Tree Species in Para, Brazil: Links Between Species Life History and Forest Management and Conservation. PhD Dissertation. Pennsylvania State University, State College, PA	"The eight study species differ markedly in life history traits. Two species, <i>Manilkara huberi</i> and <i>Astronium lecoitei</i> display characteristics that would place them in the shade-tolerant category under many classification systems (Table 3.2): adult population structures are relatively balanced with abundant stems in the pole to small adult size classes seedlings and saplings are abundant in undisturbed forest understory and are capable of surviving for years under low light levels; growth is relatively slow with many individuals showing no appreciable growth for years at a stretch (Schulze Chapter 7);. These traits render <i>Astronium</i> and <i>Manilkara</i> adept at colonizing natural treefall gaps in cases where seedlings and saplings are already present (advance regeneration)."
	Cysneiros, V.C., Antônio Dalmaso, C., Libanio Pelissari, A., Povia de Mattos, P., de Souza, L., & do Amaral Machado, S. (2018). Spatial patterns and interactions of dominant tree species in an Amazon tropical rainforest. <i>Revista de Biología Tropical</i> , 66(3), 1009-1017	[Needs shade to establish. Becomes less dependent or tolerant of shade in later stages of growth] " <i>Astronium lecoitei</i> and <i>Peltogyne paniculata</i> need shade in the early stages of life, with an increased need for light throughout their development (Ferraz et al., 2004; Rivera-Martín et al., 2013)."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Cysneiros, V.C., Antônio Dalmaso, C., Libanio Pelissari, A., Povia de Mattos, P., de Souza, L., & do Amaral Machado, S. (2018). Spatial patterns and interactions of dominant tree species in an Amazon tropical rainforest. <i>Revista de Biología Tropical</i> , 66(3), 1009-1017	" <i>Astronium lecoitei</i> species is generalist regarding soil and topography (Figueiredo, Venticinque, Figueiredo, & Ferreira, 2015), and it occurs in the studied area in aggregated form and widely distributed."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Lanjouw, J. & Stoffers, A. L. (1976). <i>Flora of Suriname</i> . Vol. II, Part 2. Papilionaceae, Mimosaceae, Connaraceae, Annonaceae, Additions and Corrections. Foundation Van Eedenfonds, Leiden, The Netherlands	"Large tree. Branches glabrous. Petiole 6-8 cm long. Leaves 15- 35 cm long, with 8 or 9 leaflets; leaflets on 8- 12 mm long petiolules, subcoriaceous, glabrous, shining above, oblong-lanceolate or oblong-ovate, 7-15 cm long and 2-4.5 cm wide, abruptly long-acuminate with an acute point, base more or less unequal, obtuse; costa and secondary veins prominulous above, prominent beneath."

412	Forms dense thickets	n
	Source(s)	Notes
	Cysneiros, V.C., Antônio Dalmaso, C., Libanio Pelissari, A., Povia de Mattos, P., de Souza, L., & do Amaral Machado, S. (2018). Spatial patterns and interactions of dominant tree species in an Amazon tropical rainforest. <i>Revista de Biología Tropical</i> , 66(3), 1009-1017	" <i>Astronium lecoitei</i> species is generalist regarding soil and topography (Figueiredo, Venticinque, Figueiredo, & Ferreira, 2015), and it occurs in the studied area in aggregated form and widely distributed." [No evidence in this study]

Qsn #	Question	Answer
501	Aquatic	n
	Source(s)	Notes
	KewScience. (2022). Plants of the World Online - <i>Astronium lecointei</i> . http://powo.science.kew.org . [Accessed 14 Apr 2022]	"Habitat according IUCN Habitats Classification: forest and woodland, shrubland, native grassland, artificial - terrestrial."
502	Grass	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 14 Apr 2022]	Family: Anacardiaceae Subfamily: Anacardioideae
503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 14 Apr 2022]	Family: Anacardiaceae Subfamily: Anacardioideae
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Lanjouw, J. & Stoffers, A. L. (1976). Flora of Suriname. Vol. II, Part 2. Papilionaceae, Mimosaceae, Connaraceae, Annonaceae, Additions and Corrections. Foundation Van Eedenfonds, Leiden, The Netherlands	"Large tree. Branches glabrous."
601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Cysneiros, V.C., Antônio Dalmaso, C., Libanio Pelissari, A., Povia de Mattos, P., de Souza, L., & do Amaral Machado, S. (2018). Spatial patterns and interactions of dominant tree species in an Amazon tropical rainforest. <i>Revista de Biología Tropical</i> , 66(3), 1009-1017	"The selected species are dominant on studying area, presenting the highest values of importance in the forest (Péllico Netto et al., 2017). These species are widely traded in Amazon region due to characteristics that suit the tropical timber market (IBAMA, 1997; Ferreira & Hopkins, 2004; Rivera-Martín, Peñuela- Mora, Rojas, & Jaramillo, 2013)." [No evidence. Common in study area]
	IUCN. (2022). The IUCN Red List of Threatened Species. Version 2021-3. https://www.iucnredlist.org . [Accessed 18 Apr 2022]	Not listed
602	Produces viable seed	y

Qsn #	Question	Answer
	Source(s)	Notes
	Daibes, L. F. et al. (2019). Thermal requirements of seed germination of ten tree species occurring in the western Brazilian Amazon. <i>Seed Science Research</i> , 29(2), 115-123	"Regeneration from seed affects species assembly in plant communities, and temperature is the most important environmental factor controlling the germination process. Thermal dependence of seed germination is thus associated with species occurrence in an ecosystem. Hence, we aimed to investigate the role of temperature on seed germination of ten tree species from the western Brazilian Amazon. Seeds were collected in the state of Rondônia, Brazil, and set to germinate under constant temperatures ranging from 10 to 40°C in germination chambers. We calculated germination capacity (G%), germination rate (GR50, reciprocal of germination time), and thermal parameters, such as cardinal temperatures and thermal time requirements. Most species had a large range of temperatures showing G% ≥80%, with optimal temperature varying from 20 to 40°C. Base temperature ranged from 6 to 12°C and ceiling temperatures were mainly >40°C. <i>Astronium lecointei</i> and <i>Parkia nitida</i> showed high germination capacity under temperatures of 35–40°C, while germination of <i>Theobroma cacao</i> dropped from 100% to zero under temperatures between 37 and 40°C. The climax species <i>Cedrela fissilis</i> had the slowest germination time (10 days) and highest thermal time requirement, while seeds of <i>Enterolobium schomburgkii</i> (a late-successional species) germinated within the first day of the experiment. Rapid recruitment of Amazon species could be favoured with treefall disturbance, which increases temperatures in the understory, but sharp limits might be found in the supra optimal range of temperatures. Such patterns might indicate different regeneration strategies in the tropical rainforest, providing important information regarding seed germination among Amazon species."
	Tropical Plants Database, Ken Fern. (2022). <i>Astronium lecointei</i> . http://tropical.theferns.info . [Accessed 14 Apr 2022]	"Propagation Seed "

603	Hybridizes naturally	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown. No evidence found

604	Self-compatible or apomictic	
	Source(s)	Notes
	Barkley, F. A. (1968). Anacardiaceae: Rhoideae: <i>Astronium</i> . <i>Phytologia</i> 16(2): 107-152	[Unknown] "The plants being polygamodioecious, either have only pistillate or only staminate flowers." [A polygamodioecious species in which one plant has female and bisexual flowers and another has male and bisexual flowers.]

605	Requires specialist pollinators	n

Qsn #	Question	Answer
	Source(s)	Notes
	Compêndio Online Gerson Luiz Lopes. (2022). <i>Astronium lecoitei</i> Ducke Maracatiara. https://sites.unicentro.br/wp/manejoflorestal/astronium-lecoitei-ducke-maracatiara/ . [Accessed 18 Apr 2022]	"Polinização: muito visitada por abelhas" [Translation: Pollination: much visited by bees]
	Santos, C. M. M. D., Santana, E. S., Modro, A., Maia, E., Moretti, S. D. A., & Ribeiro, K. L. (2018). Potencial apícola de espécies cultivadas em sistemas agroflorestais na zona da mata rondoniense. <i>Cadernos de Agroecologia</i> , 13(1): 1-7	"Tabela 1. Espécies com potencial apícola encontradas em Sistemas Agroflorestais na Zona da Mata Rondoniense, Brasil, caracterizadas de acordo com suas interações com as abelhas em plantas com recurso: N=néctar; P=pólen." [Translation from Portuguese: Table 1. Species with beekeeping potential found in Agroforestry Systems in Zona da Mata Rondoniense, Brazil, characterized according to their interactions with bees in plants using: N=nectar; P=pollen. <i>Astronium lecoitei</i> nectar and pollen used by bees]

606	Reproduction by vegetative fragmentation	
	Source(s)	Notes
	Tropical Plants Database, Ken Fern. (2022). <i>Astronium lecoitei</i> . http://tropical.theferns.info . [Accessed 18 Apr 2022]	"Propagation - Seed"
	WRA Specialist. (2022). Personal Communication	Unknown, but no evidence found of natural vegetative spread

607	Minimum generative time (years)	
	Source(s)	Notes
	Schulze, M.D. (2003). Ecology and Behavior of Nine Timber Tree Species in Para, Brazil: Links Between Species Life History and Forest Management and Conservation. PhD Dissertation. Pennsylvania State University, State College, PA	" <i>Astronium lecoitei</i> , the sixth species in the study, is a relatively shade-tolerant species with abundant regeneration in both forest understory and gaps, yet capable of fast growth under optimal conditions"
	Laurance, W. F., Nascimento, H. E., Laurance, S. G., Condit, R., D'Angelo, S., & Andrade, A. (2004). Inferred longevity of Amazonian rainforest trees based on a long-term demographic study. <i>Forest Ecology and Management</i> , 190 (2-3), 131-143	[Unknown. Long-lived, relatively slower growing species] "Table 1. Family, guild, maximum diameter (maximum dbh), diameter growth rates, and maximum longevity data for 93 species of Amazonian trees" [<i>Astronium lecoitei</i> - Growth rates (mm per year) = 1.19 to 2.28; Estimated age (years) = 335]

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Schulze, M.D. (2003). Ecology and Behavior of Nine Timber Tree Species in Para, Brazil: Links Between Species Life History and Forest Management and Conservation. PhD Dissertation. Pennsylvania State University, State College, PA	"Table 3.5. Fruit and fruit crop characteristics of eight tree species, Pará, Brazil" [<i>Astronium lecoitei</i> - Dispersal = Wind] [No evidence. No means of external attachment]

Qsn #	Question	Answer
702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Cultivated by an Oahu nursery (DOFAW, pers. comm.) and possibly elsewhere in the state.

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	No evidence and unlikely. A tree with a presumably long time to maturity, and not cultivated with produce

704	Propagules adapted to wind dispersal	y
	Source(s)	Notes
	Cysneiros, V.C., Antônio Dalmaso, C., Libanio Pelissari, A., Povia de Mattos, P., de Souza, L., & do Amaral Machado, S. (2018). Spatial patterns and interactions of dominant tree species in an Amazon tropical rainforest. <i>Revista de Biología Tropical</i> , 66(3), 1009-1017	" <i>Astronium lecoitei</i> has irregular fruiting, with numerous fruits, which are small and easily dispersed by wind (Ferraz et al., 2004);"
	Schulze, M.D. (2003). Ecology and Behavior of Nine Timber Tree Species in Para, Brazil: Links Between Species Life History and Forest Management and Conservation. PhD Dissertation. Pennsylvania State University, State College, PA	" <i>Astronium lecoitei</i> , the wind-dispersed species that did not display a significant relationship between juvenile density and orientation of gaps in relation to seed trees, has relatively high adult densities in the study areas and shade-tolerant seedlings. In skid trail samples all four wind-dispersed species, including <i>Astronium lecoitei</i> , displayed significantly higher densities downwind (0-100m) than upwind (0-100m) from seed trees."
	Rodrigues, B. L., Bruzinga, J. S. C., Ribeiro, R. B. D. S., Gama, J. R. V., Machado, E. L. M., & Oliveira, M. L. R. D. (2021). Pattern and spatial associations of commercial trees in the Amazon. <i>Ciência Rural</i> , 51(6): 1-12	"Most commercial tree groups showing an aggregated pattern in a minimum of 50% of the area under study exhibit zoochoric dispersion, indicative of a likely limitation in seed dispersal. <i>A. lecoitei</i> seeds were dispersed anemochorically, those of while <i>B. guianensis</i> were dispersed zoochorically"

705	Propagules water dispersed	n
	Source(s)	Notes
	Schulze, M.D. (2003). Ecology and Behavior of Nine Timber Tree Species in Para, Brazil: Links Between Species Life History and Forest Management and Conservation. PhD Dissertation. Pennsylvania State University, State College, PA	" <i>Astronium lecoitei</i> , the wind-dispersed species that did not display a significant relationship between juvenile density and orientation of gaps in relation to seed trees, has relatively high adult densities in the study areas and shade-tolerant seedlings. In skid trail samples all four wind-dispersed species, including <i>Astronium lecoitei</i> , displayed significantly higher densities downwind (0-100m) than upwind (0-100m) from seed trees." [No evidence, although some secondary dispersal by water may be possible]

706	Propagules bird dispersed	n
	Source(s)	Notes

Qsn #	Question	Answer
	Schulze, M.D. (2003). Ecology and Behavior of Nine Timber Tree Species in Para, Brazil: Links Between Species Life History and Forest Management and Conservation. PhD Dissertation. Pennsylvania State University, State College, PA	"Table 3.5. Fruit and fruit crop characteristics of eight tree species, Pará, Brazil" [<i>Astronium lecoitei</i> - Dispersal = Wind]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Schulze, M.D. (2003). Ecology and Behavior of Nine Timber Tree Species in Para, Brazil: Links Between Species Life History and Forest Management and Conservation. PhD Dissertation. Pennsylvania State University, State College, PA	"Table 3.5. Fruit and fruit crop characteristics of eight tree species, Pará, Brazil" [<i>Astronium lecoitei</i> - Dispersal = Wind] [No evidence. No means of external attachment]

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Schulze, M.D. (2003). Ecology and Behavior of Nine Timber Tree Species in Para, Brazil: Links Between Species Life History and Forest Management and Conservation. PhD Dissertation. Pennsylvania State University, State College, PA	"Table 3.5. Fruit and fruit crop characteristics of eight tree species, Pará, Brazil" [<i>Astronium lecoitei</i> - Dispersal = Wind] [No evidence]

801	Prolific seed production (>1000/m2)	n
	Source(s)	Notes
	Cysneiros, V.C., Antônio Dalmaso, C., Libanio Pelissari, A., Povia de Mattos, P., de Souza, L., & do Amaral Machado, S. (2018). Spatial patterns and interactions of dominant tree species in an Amazon tropical rainforest. <i>Revista de Biología Tropical</i> , 66(3), 1009-1017	" <i>Astronium lecoitei</i> has irregular fruiting, with numerous fruits, which are small and easily dispersed by wind (Ferraz et al., 2004);" [Possibly no if fruiting is irregular]
	Schulze, M.D. (2003). Ecology and Behavior of Nine Timber Tree Species in Para, Brazil: Links Between Species Life History and Forest Management and Conservation. PhD Dissertation. Pennsylvania State University, State College, PA	"Table 3.5. Fruit and fruit crop characteristics of eight tree species, Pará, Brazil" [<i>Astronium lecoitei</i> - Mean estimated fruit crop size = 1,900]

802	Evidence that a persistent propagule bank is formed (>1 yr)	n
	Source(s)	Notes
	Cruz, E.C. & de Sousa, J. T. A. (2022). Germinação de sementes de espécies amazônicas: muiracatiara (<i>Astronium lecoitei</i> Ducke). Comunicado Técnico 338. Embrapa Amazônia Oriental, Belém, PA Janeiro	"As sementes não apresentam dormência e a germinação é epígea, ou seja, os cotilédones ficam expostos acima da superfície do substrato" [Translation: The seeds do not show dormancy and germination is epigeous, or that is, the cotyledons are exposed above of the substrate surface]

803	Well controlled by herbicides	n

Qsn #	Question	Answer
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown. No evidence on herbicide efficacy or chemical control of this species

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown. Other species are reported to resprout from cut stumps

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Broad climate suitability (based on elevation and rainfall gradients)
- Thrives, and could spread, in regions with tropical climates
- Shade tolerant
- Tolerates many soil types
- Reproduces by seeds
- Seeds dispersed by wind, possibly water, and intentional cultivation

Low Risk Traits

- No reports of invasiveness or naturalization, but no evidence of widespread introduction outside native range
- Unarmed (no spines, thorns, or burrs)
- Non-toxic
- Polygamodioecious. Self-fertility unknown but may require outcrossing for seed set.
- Seeds lack dormancy, and should not form a persistent seed bank